

Healthy Ecosystems



New England's ecosystems are our most valuable natural assets. The richness of our waterways provides opportunities to see remarkable creatures such as bald eagles and striped bass. The northern forest provides habitat for bear, moose and hundreds of species of birds. And, of course, our wetlands provide critical habitat and nurseries for birds

and fish. But human activities can threaten these resources by altering environmental conditions. While we've made dramatic progress protecting many of our ecosystems in recent decades, we still face some enormous challenges, not the least of which are New England's changing climate, acid rain and protecting tidal and freshwater wetlands.

Partnering To Restore Connecticut's Fishways

Like hundreds of dams in Connecticut, the small dam at Ed Bill's Pond on the Eightmile River in Lyme has long prevented blueback herring, alewife and other migratory fish from swimming upstream to prime spawning grounds.

The Connecticut River Watershed Council designed a fish ladder to fix the problem, but when the construction bids came in there wasn't enough money. A \$24,880 grant from the Connecticut Corporate Wetlands Restoration Partnership (CWRP) bridged the gap, and today visitors to Ed Bill's Pond see a new fishway alongside the dam that's attracting herring in the spring.

Ed Bill's Pond is among many aquatic habitats across Connecticut benefitting from the Connecticut Corporate Wetlands Restoration Partnership. Launched in June 2000, the voluntary program has a dozen active corporate members that have contributed more than \$150,000 of funds and various in-kind services to enhancement projects around the state. The group is also commissioning a study to identify 30 to 40 coastal and inland projects that can be done in the coming years.

"This is a terrific program for us," said Tom Miner, executive director of the watershed council, which is using CWRP support for several fishway projects around the state.

"It allows companies to 'walk the talk' and really do something to restore our natural resources," added Timothy Keeney, environmental director at Northeast Utilities, which has taken a leadership role in the partnership. First launched in Massachusetts in 1999, CWRP initiatives are now underway in four of the six New England states, Rhode Island and Maine being the most recent additions to the program.

NEW ENGLAND'S CHANGING CLIMATE

New England's climate is changing and the implications for the region's environment already are being felt. According to a report issued last year for the U.S. Global Change Research Program, temperatures in New England are getting warmer, especially in the winter months. From 1895 to 1999, overall temperatures in the region warmed by 0.7 degrees, with Rhode Island and New Hampshire warming by two to three times the regional average. Even bigger temperature hikes were recorded in the winter months, with the region's average temperatures rising by 1.8 degrees and New Hampshire and Vermont seeing the biggest jumps.

The warming trend is being felt all across the region, with earlier maple sap flows, earlier dates for ice melting and reduced snowfall being just a few of the examples cited in the *New England Regional Assessment Report*.

Warming temperatures may also be a factor in the spread of insects and diseases in some of New England's forests and dramatic drops in winter flounder populations, which rely on near-freezing water temperatures to spawn.

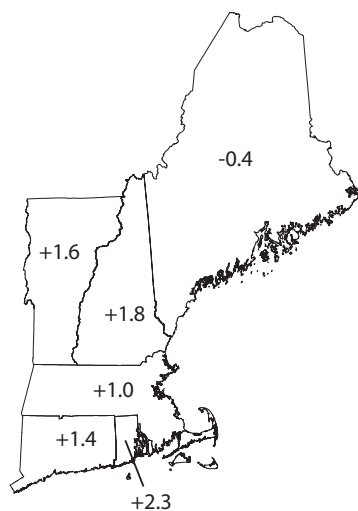
All of these changes are sending ripples through the region's economy, with Vermont's maple syrup industry seeing some of the biggest impacts. Optimum conditions for maple syrup production—freezing nights and warm daytime temperatures—have been gradually shifting from northern New England to the more northern Canadian Provinces. Vermont, the largest syrup producer in the U.S., historically had optimum sap flows from mid-March to mid-April. More recently, the sap flows have been starting a month earlier, resulting in reduced sap flows, shorter tapping seasons and a lower grade product. The end result: Vermont's annual

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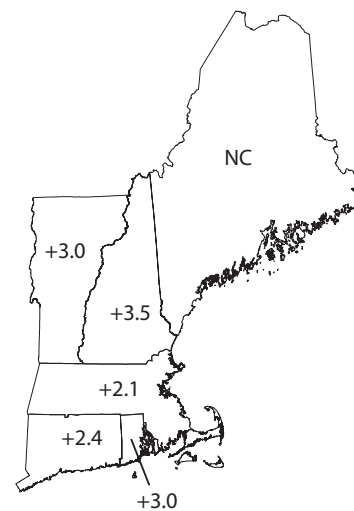
— Timothy Keeney



Regional Temperature Changes 1895-1999



Weighted Averages + 0.74°F



Winter Weighted Averages + 1.8°F

source: Data from New England Regional Assessment, provided by UNH

production is a third of what it was at the beginning of the 20th century and Canada's syrup output has tripled in just the past 25 years.

To lessen the risk of climate change in the years ahead, EPA has launched a number of voluntary programs to reduce carbon dioxide and other greenhouse gas emissions being released into the earth's atmosphere. In addition to our Energy Star program, which has prevented 150 million metric tons of greenhouse gas emissions, we've started a climate leaders partnership that encourages companies to develop long-term comprehensive climate change strategies, including commitments to specific reduction goals.

Our Global Climate Change Initiative commits America to cut greenhouse gas intensity by 18 percent over the next 10 years. Greenhouse gas intensity is the ratio of greenhouse gas emissions to economic output. The goal is to lower our rate of emissions from an estimated 183 metric tons per \$1 million of gross domestic product

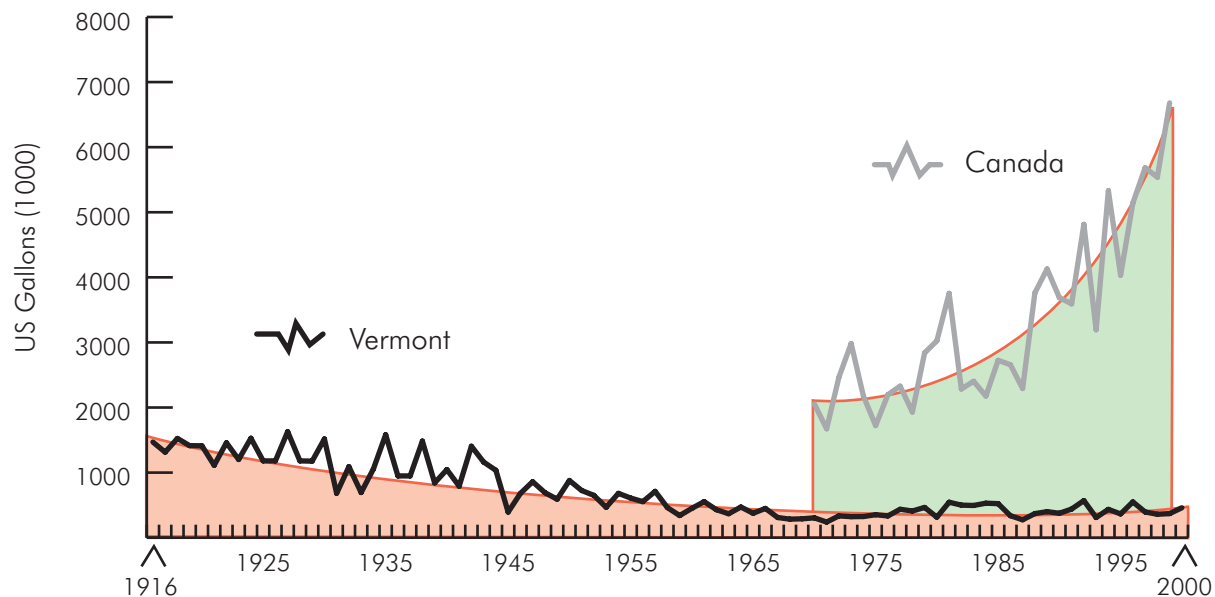
(GDP) to 151 metric tons per \$1 million of GDP in 2012. The initiative also supports vital climate change research and provides \$4.5 billion for climate change related activities. This includes the first year of funding for a five-year, \$4.6 billion commitment to tax credits for renewable energy sources.

ACID RAIN

New England's forests and water bodies are greatly influenced by the air that passes over the region. Air that is laced with sulfur dioxide (SO₂) and nitrogen oxide (NO_x) from power plants and other combustion sources causes insidious pollution known as acid rain.

Acid rain first emerged as a problem in the late 1970s and is still a major concern for New England. Acid rain disrupts the chemical balances in trees, weakening their natural defenses and making them more vulnerable to diseases and insects. It has been widely cited as contributing

Maple Syrup Production Declines in Vermont and Rises in Canada



source: Data from Shannon Spencer, New England Regional Assessment, UNH

to the decline of the spruce-fir forests throughout the Eastern United States.

Acid rain also increases the acidity of lakes and streams, making them uninhabitable for desirable species of fish. And, lastly, nitrates in acid rain contribute to eutrophication in many of New England's estuaries, which can lead to unwanted algae growth and oxygen depletion in the water. As much as 40 percent of total nitrogen entering Casco Bay in Maine, for example, may come from atmospheric deposition, which includes acid rain.

The good news is that SO_2 and NO_x emissions from power plants are declining. Relying on a market-based cap and trade program, New England power plants reduced their SO_2 emissions by 45 percent and NO_x emissions by 65 percent from 1990 to 2000. Those reductions have led to decreases in atmospheric deposition, the most telling example a 25 percent drop in average sulfate deposition in Maine between 1980 and 1999. Still, we have not

seen significant improvements in our ecosystems. Some studies predict it will take decades for lakes and other water bodies to fully recover from the effects of acid rain.

To help foster those recovery efforts, President Bush recently launched a Clear Skies Initiative aimed at cutting power plant emissions of SO_2 by 73 percent and NO_x by 67 percent between 2000 levels and 2018. The strategy will rely on the same market-based approach that the agency's Acid Rain Program used so successfully in the 1990s.

PROTECTING TIDAL AND FRESHWATER WETLANDS

Tidal wetlands play a critical role in New England's environment, providing important habitat and nurseries for birds and fish and improving water quality by filtering out pollutants. Coastal salt marshes are among the most biologically pro

ductive ecosystems in the world, rivaling tropical rainforests in the amount of plant material produced each year.

For many decades, the public did not appreciate or understand the importance of tidal wetlands. As a result, thousands of acres of tidal marshes in New England were filled for development, used for garbage disposal, or drained to control mosquito populations. Laws passed in the early 1970s halted large-scale loss of tidal marshes by requiring permits for activities in these areas.

Restoring degraded tidal wetlands is a high priority in New England. The Connecticut Department of Environmental Protection has won national recognition for helping to restore more than 1,700 acres of tidal wetlands since 1980. Massachusetts has restored nearly 300 acres

of tidal wetlands since 1994, including more than 100 acres in Rumney Marsh north of Boston through a local/state/federal partnership. We're also using enforcement settlements to reclaim tidal areas, the most noteworthy example an agreement by Amtrak to spend about \$400,000 to improve tidal flows at seven culvert locations along Amtrak's shoreline rail route in Connecticut. Last year's agreement stemmed from Clean Water Act violations that EPA found at nine Amtrak facilities.

Reducing the loss of freshwater wetlands is another high priority. Hundreds of acres in the region are being altered or lost each year through wetlands permitting programs, although some of the losses are offset by wetland mitigation projects. Connecticut in 1999, for example, had

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— Katherine Groves



132 acres of permitted wetlands alterations and 66 acres of wetlands created through mitigation.

EPA also is concerned about wetlands losses that are occurring outside of permitting programs. Our enforcement team is investigating numerous cases of possible illegal filling of wetlands, including sites in Vermont, Maine and southeastern Massachusetts. A handful of cases have led to formal enforcement actions. We're also boosting outreach and education programs to help property owners understand state and federal wetland laws, one such example a \$25,000 EPA grant to the state of Vermont for outreach and education to the state's farmers.

Partnerships Key in Restoring Casco Bay

Casco Bay in Maine has always been postcard beautiful. But the bay's water quality is a different story. More than three centuries of human activities on the shores and tributaries of the bay took their toll, with their worst pollution coming in the last 75 years. Old-timers can still recall the putrid odors of pollution that peeled the paint off houses. Shellfishing in the bay posed a serious health risk.

But the bay's fortunes are improving. In 1990, the EPA designated Casco Bay an estuary of national significance and provided substantial financial support for its recovery. The work is being done through the Casco Bay National Estuary Project, a collaboration between the University of Southern Maine, EPA, the Maine Department of Environmental Protection and many other local, regional and state partners.

With close technical support coming from Normandeau Associates and the MER Assessment Corp. of Harpswell, and assistance from municipalities and shellfish harvesters, the estuary project has identified and removed numerous pollution sources from around the bay, including dozens of antiquated septic systems as well as runoff from roadways and small farms. The improved water quality has resulted in 200 acres of shellfish beds, all north of Portland, being opened for harvesting.

"Opening up these shellfish areas is proof positive of our progress," said Katherine Groves, director of the estuary project. "Not only have sources of pollution been removed and shellfish beds opened, but the public 'feels' better about the bay and its environment when they see shellfishermen out there working. It makes an inherent statement that the waters are clean."

Groves credits the improvements to a strong cooperative spirit. "It is through partnerships with local, state and federal stakeholders that the estuary project is opening shellfish beds, protecting open space (more than 3,000 acres to date), developing sub-watershed protection plans and identifying and addressing water and sediment quality problems," she said.